Mount Diablo Astronomical Society

Diablo MoonWatch

September 2014

General Meeting

Tuesday September 23, 2014

Unwrapping the Visual Discovery of Spiral Nebulae

By Steve Gottlieb

Doors open at 6:45 p.m.
Lindsay Wildlife Museum
1931 First Avenue,
Walnut Creek, CA 94597

Please park East of the museum, follow the instructions on the last page

This is the story of William Parsons' (Third Earl of Rosse) first visual observations of M51 with his massive 72-inch speculum reflector in the spring of 1845 and the subsequent discovery of spiral structure in dozens of "nebulae".

The context is how our preconceived notions and knowledge of the nature of the objects we view in the telescope affect our visual perception at the eyepiece. Beautiful eyepiece sketches of several spirals by Rosse and other

mid-19th century observers will be presented and we can discuss our own favorite spirals and observing experiences.

I've been an active observer since 1977 beginning with a 6-inch reflector and capturing aperture fever up to his current 24-inch reflector. During this time I've observed the entire NGC visible from the U.S. (7100 objects) and logged over 12,000 deep sky objects. These observations have resulted in numerous historical corrections of the NGC and IC catalogues as a member of the NGC/IC Project. I've also compiled the databases in computerized Digital Setting Circles made by Lumicon and Celestron as well as the Orion "Deep Map 600". Over the years I've written numerous deep sky observing articles for Sky & Telescope and Astronomy magazines and currently am a contributing editor for Sky & Telescope, with an article in the September issue on interacting galaxies.

What's Up

Recovery of the International Solar-Earth Explorer spacecraft

by Mike Harms

ISEE-3 was launched by NASA on August 12, 1978, into a halo orbit. It was one of three spacecraft, built for the International Sun-Earth Explorer program to study the inter-

(Continued on page 6)

Monster Eyepieces!

By Chris Ford

Using the Explore Scientific 30mm 100 degree eyepiece

Early in 2013, well known eyepiece vendor Explore Scientific disclosed that they were developing a 3" barrel 100 degree eyepiece weighing no less than 5 pounds 9 ounces along with a 3" diagonal. The rational for this escalation in size is that the existing 2" eyepiece barrel diameter has reached the limits in dealing with 100 degree fields of view over 21mm of focal length. (Why there is no larger Ethos) Moving to a 3"

(Continued on page 3)

President's Corner

This Month's Club News and Commentary

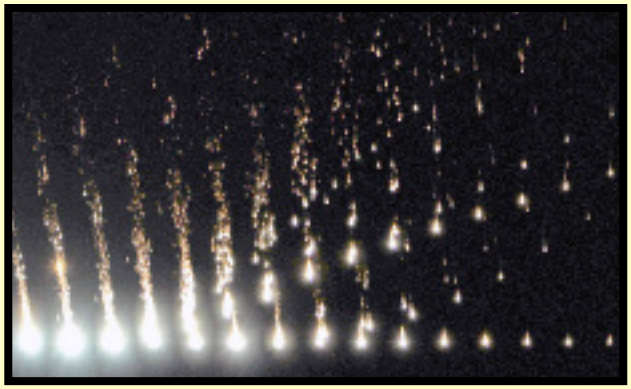
by Jim Head

Recent events:

The reports from Yosemite have been very good, visitors kept the lines going with Saturn and other delights, camping went well. The same weekend was our Society Night, the seeing was better than originally expected.. Little critters with tails attacked the observatory once again! On Sunday, we had 6 solar-filtered scopes for Solar event at the LWM, many visitors enjoyed the views, seeing was fairly good, the Sun was the star, very active with huge proms, small flare in process, and thick filaments among many sunspots.

Meteorite mystery unfolding

When our Moon formed, the collision likely spread debris into our solar system, and apparently made it's mark on the meteorite that fell in and around Novato, CA, in 2012. Over 50 researchers have put together a timeline and history for the meteorite, it's an amazing story, Dr. Peter Jennikins tracked the trajectory from data obtained from the CAM all-sky network: http://cams.seti.org/easyCAMS.html



Novato Meteorite Fall.jpg: End of flight fragmentation of the Nov. 18, 2012, fireball over the San Francisco Bay Area (shown in a horizontally mirrored image to depict the time series from left to right). These photographs were taken from a distance of about 65 km.
Image Credit: Robert P. Moreno Jr., Jim Albers and Peter Jenniskens

"We now suspect that the moon-forming impact may have scattered debris all over the inner solar system and hit the parent body of the Novato meteorite." says Qing-zhu Yin, professor in the Department of Earth and Planetary Sciences at the University of California (UC), Davis. Read the NASA Press Release at http://tinyurl.com/seticam

Comet Jacques!

Comet Jacques is viewable in binoculars, moving from Cassiopiea to Cepheus, traveling at over 82,000 mph! Many broadcasters are showing the comet each evening on the website http://www.night-skiesnetwork.com/

Here a few other links to this and other comets: http://www.live-cometdata.com/comets/c2014-e2-jacques/ http://cometchasing.skyhound.com/ http://www.minorplanetcenter.net/iau/Ephemerides/Comets/index.html

Random Acts of Science

The Eastbay Astronomical Society, Chabot Space and Science Center, and the Oakland Fire Department have started a new project called Random Acts of Science. They have outfitted a cargo trailer with nearly everything needed to bring large-screen

President's Corner (Continued from page 2)

video to schools, parks, and other public places. The EAS and CSSC are providing the telescope and video camera. There was a trial run recently, here are a few pics of the inflatable large screen. The PA is very loud, theater-quality booming. I wonder if this would work well out here too?

Upcoming Events

This year's annual observing event near Lake San Antonio, referred to as CalSTAR, is scheduled for Sep 25-28th. Last year the seeing was great, but cold late at night. Richard Ozer predicts much warmer weather. . . There is no registration, just show up, camping is $10 per night, more info can be found on TAC's calendar at http://www.observers.org/

If you are thinking a higher viewpoint would be better, check-out the Barcroft High-Altitude Starparty Sep 21-26, near White Mountain, 12,450 feet! More information is at http://www.eastbayastro.org/index/Barcroft.htm

Our next Public night is Saturday, Aug 30th, Imaging meeting Sep 18, Society Nights Sep 20th, the next Public Night is on Sep 27. We could use help parking cars during the start of our Public Nights.

Hope to see you in a dark and starry night!

Jim

2014 Yosemite Star Party

Photos taken by Donna Ray and the editor.
Top left is Ralph Requa, in the middle Lance Schlichter and an overview of the amphitheater at Glacier Point.
More images on page 8

Monster Eyepieces! (Continued from page 1)

barrel format opens up the possibility of ultra wide field of views at lower powers than is possible in a 2" eyepiece.

Explore Scientific should take credit for being innovative and taking the risk of manufacturing a 3" eyepiece which is generally a larger telescope eyepiece, best suited for large refactors and Cassegrains with 3" or larger focusers. For reasons of weight, focuser format, and exit pupil, it is less well suited to a majority of Dobsonians and Newtonians. Certainly larger 3" and 4" eyepieces have always been available as custom made units, most commonly from Siebert, but these were generally used in larger observatories. Explore Scientific are aiming this new 3" eyepiece squarely at the amateur market.

Comparisons: From left to right, (i) the Explore 30 mm 100 degree eyepiece, (ii) The Explore Scientific 9mm 120 degree eyepiece, (iii) The famous Televue Nagler Type 5 31mm, (iv) The Televue Ethos 21mm.

So let us wind forwards to the summer of 2014 where this giant eyepiece is now available. Being an astronomical early adopter always on the look out for that contrasty yet immersive wide field high definition experience in my observing, I have long been intrigued by the potential of this eyepiece and decided to place an advance order for one. After waiting almost a year, serial #3 duly arrived on my doorstep last month. Following is a preliminary report on what moving to the 3" format actually entails.

First changing from 2" to 3" scales up far more dramatically than a mere extra 1" of diameter might suggest. The weight almost triples and physical size at least doubles. The size differential compared to current 2" giant eyepieces is obvious in the pictures, and weight balancing becomes a serious consideration, especially hanging off the end of a long refractor! I have not tried the 3" eyepiece in a Cassegrain telescope yet, but expect that more compact configuration is likely to be more tolerant of the eyepieces considerable weight and bulk.

At first light in my 7.1" refractor, the extremely wide field of view at low power was immediately obvious.

The 30mm 100 degree format increases the field of view by about 13.5% which on paper sounds considerably less than it is to actually experience. Observing through this eyepiece presented a very wide sense of spaciousness with a much wider field of view than I was used to in a 31mm Nagler Type 5. Fitting M57 and the two bright framing stars all within the same visual presentation on a black sky background was highly seductive. In some ways it felt aesthetically like a binocular view, but with the magnification, clarity, and stability you get from a big refractor. M39 and M27 also presented very pleasing and contrasty views. Sagittarius was low in the sky this August, but M8 and M17 were very nicely framed. The eyepiece scored high on enjoyment on big popular targets.

In terms of optical quality, edge to edge, the stars remained sharp until about the final 1/10 of the way to the field stop, when some aberrations became obvious. In that sense, the eyepiece did not appear to deliver the overall edge to edge crispness of a 83 degree Nagler 31mm Type 5, but how much of that is the combination in my particular telescope/eyepiece configuration I cannot yet determine. I wanted to do A/B comparisons with the same 3" diagonal and Nagler 31mm Type 5, but I just could not fit that eye-

This is a big eye piece!

Monster Eyepieces! (Continued from page 4)

The 3" eyepiece in a 7.1" refractor looks deceptively small because the refractor is big!

piece into the 3" to 2" adapter which was too tight to receive almost all my Televue eyepieces. (I was not aware that the Explore Scientific interpretation of 2" is slightly tighter than the Televue interpretation of 2" as I was able to slide a 9mm ES eyepiece into the adapter with no difficulty.) I was though (just) able to squeeze a 41mm Panoptic into the 3" to 2" adapter, which despite its greater focal length, still presented a smaller overall field of view and was almost claustrophobic after the 30mm 100 degree Explore Scientific, along with a significantly reduced contrast due to its longer focal length. I also noticed that the eyepiece was more sensitive to paraxial eye displacement than I expected. With wide 100 degree fields you often end up turning your head almost sideways to look towards the edge, but on moving too far off axis in this eyepiece, the image became more abberated across the field. I don't recall my 100 degree Ethos eyepieces being that sensitive to head placement. It was not that big a deal once aware of it however.

Looking up the nosepiece as can be seen in the attached picture, the field stop does not quite take advantage of all 3" of barrel available. My impression is that 30mm and 100 degrees may actually have been a little conservative on Explore Scientific's part, and a 35mm 100mm would have delivered the kind of spacious field of view that would have differentiated it even more dramatically from standard 2" wide-field eyepieces. However that would have come at the expense of even more weight and bulk, so 30mm is likely the best balance for an introductory 3" eyepiece.

I am also not convinced that the Explore Scientific 3" diagonal is up to the physical demands of carrying an eyepiece of this weight. As my 7.1" refractor flipped from one side of the meridian to the other, the eyepiece would invariably end up upside down or sidewards, and the torque of that weight on the diagonal is very substantial. When putting everything away for the night, I noticed that the eyepiece holder was loose and the 6 small hex bolts needed tightening. I believe that just scaling up the 2" diagonal format to 3" is not robust enough to carry this weight on repeated occasions and that the structural demands on the diagonal are as important as the eyepiece itself. Scaling up from 2" to 3" places far more stress on the whole assembly than just that extra 1" might suggest.

All in all I certainly enjoyed testing out this eyepiece and look forwards to more becoming more familiar with it, especially under a dark rather than suburban sky. Is it worth the extra expense and impact over a 31mm Type 5 Nagler? My feelings are mixed at this stage. The view is certainly extremely spacious and immersive, more so than any other eyepiece currently available on the market, but I increasingly feel that if Explore Scientific had made the eyepiece a slightly longer focal length to use all that 3" to the maximum, it would be even more distinctive.

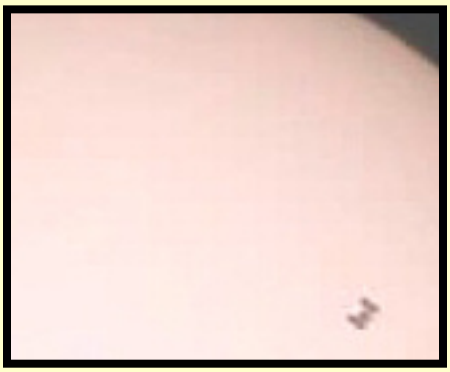
The Fieldstop does not quite use all the entire 3" diameter available suggesting longer focal lengths may be possible at 100 degrees field of view.

(The eyepiece installed in my parked telescope overnight easily stood up to our recent Mag 6.1 Earthquake which shook up my house. It is now officially Earthquake certified!)

Chris Ford

Transit of The ISS in front of the Sun.





Images taken by Mike Harms from his backyard.

It happens very fast--in about one half second. Even though these aren't very high resolution you can still make out the solar panels and the shape of the station.

If you would like to view the ISS transit the sun send your coordinates to CalSky.com. A few days before the event they will send you an email alert with the exact time and particulars. As always never view the sun without proper filtration.

What's Up *Continued from page 1.*

action between the earth's magnetic field and the solar wind. After twenty years of service it was finally decommissioned by NASA.

In 2014 Dennis Wingo and Keith Cowing formed the ISEE-3 reboot project, a crowd funded effort to bring the spacecraft back to life. In this month's "What's Up" we will find out how these remarkable individuals along with citizen scientists and engineers were able to revive a 36 year old spacecraft and begin receiving valuable scientific data again. We'll also talk about a previous project they were involved in and how one of our club's longtime members was there to help them out.

Radar Vision Maps Napa Valley Earthquake

by European Space Agency

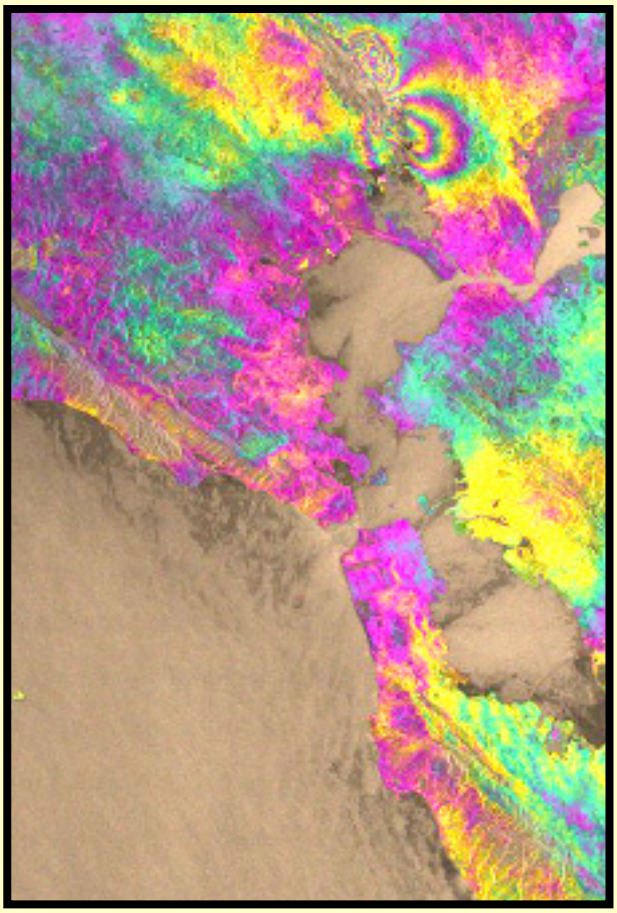
Sentinel-1A has added yet another string to its bow. Radar images from this fledgling satellite have been used to map the rupture caused by the biggest earthquake that has shaken northern California in 25 years.

Scientists collaborating through the UK Natural Environment Research Council's Centre for the Observation and Modelling of Earthquakes, Volcanoes and Tectonics (COMET), used Sentinel-1A's special capabilities to analyse the quake.

"Synthetic aperture radar interferometry" is a technique where two or more satellite radar images of the same area are combined to detect large-scale surface changes. Small changes on the ground modify the reflected radar signal and lead to rainbow-coloured fringes in the 'interferogram'.

Yngvar Larsen from Norway's Northern Research Institute and Petar Marinkovic from PPO.labs in the Netherlands processed this new interferogram from two images: one that Sentinel-1A acquired on 7 August, the day the satellite reached its operational orbit, and another captured on 31 August.

It clearly confirms that part of the West Napa Fault system was responsible for the 6.0 earthquake that rocked California's wine-producing region. However, the fault had not been identified as being particularly hazardous prior to the quake that hit on 24 August.



Sentinel-1 maps earthquake

Importantly, the extent of the ground deformation in the interferogram shows that the fault slip continues further north than the extent of the rupture mapped at the surface.

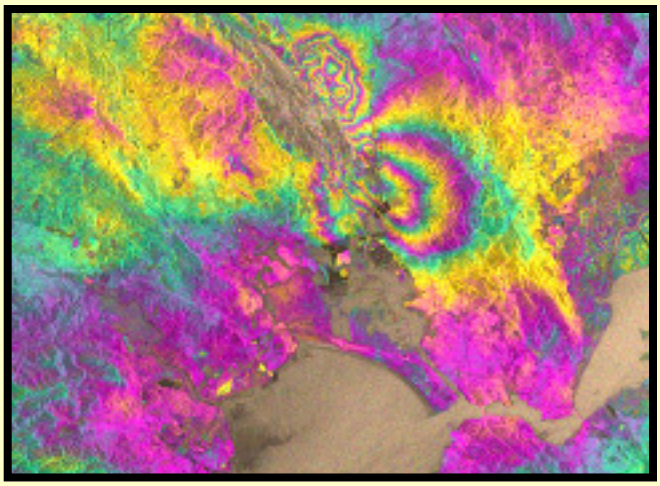
Sharp lines in the interferogram show minor movements on other faults, such as the part of the West Napa Fault system that crosses Napa airport.

COMET Director, Tim Wright, from University of Leeds said, "This successful demonstration of Sentinel-1A marks the beginning of a new era for our ability to map earthquakes from space.

"COMET scientists are building a system that will provide these results routinely for all continental earthquakes, as well as mapping the slow warping of the ground surface that leads to earthquakes."

Prof. Andy Hooper, also at the University of Leeds, added, "This satellite represents a sea change in the way we will be able to monitor catastrophic events such as earthquakes and volcanic eruptions in the future, due to its systematic observation strategy."

(Continued on page 8)



Radar Vision Maps Napa Valley Earthquake (continued from page 7)

Austin Elliott, a PhD student at the University of California Davis, one of the team mapping the earthquake rupture on the ground, said, "The data from satellites are invaluable for completely identifying the surface break of the earthquake – deformation maps from satellite imagery guide us to places where rupture has not yet been mapped."

Although Sentinel-1A is still being commissioned, ESA was able to respond specifically to the incident and provide data rapidly to the science team.

Fault damage.

Sentinel-1, Radar vision

Betlem Rosich-Tell, ESA's Project Manager for the Copernicus Sentinel-1 Payload Data Ground Segment, noted, "I'm very pleased to see that the dedication from the various Sentinel-1 ground segment teams, both at ESA and at industry, meant that we could react to an emergency at this early stage in the mission and provide an 'out-of-the-box utilisation' of Sentinel-1A data.

"The Sentinel-1 ground segment is designed to fully exploit the potential of the mission by acquiring, processing and delivering a huge amount of high-quality data products in a timely manner for both operational and scientific applications."

Sentinel-1A passes over the same spot on the ground every 12 days. However, once its identical twin, Sentinel-1B, is launched in 2016, this will be cut to just six days, so that changes can be mapped even faster.

2014 Yosemite Star Party

Images taken by Donna Ray.

Mount Diablo Astronomical Society Event Calendar–September 2014

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1	2	3	4	5	6
7	8 7:30 PM Board Meeting (Private)	9	10	11	12	13 7:00 PM Observatory Maintenance (Private) 8:00 PM Dublin Family Campout
14 sunset: 17:53	15	16 7:30 PM WCI Stargazing (Private)	17	18 7:00 PM MDAS Imaging Meeting (Private)	19	20 7:00 PM Society Observing (Private)
21 sunset: 17:41	22	23 7:15 PM GenMtg: Lord Rosse	24	25	26	27 8:30 PM Public Astronomy:Supernva
28 sunset: 17:29	29	30				

Mount Diablo Astronomical Society Event Calendar–October 2014

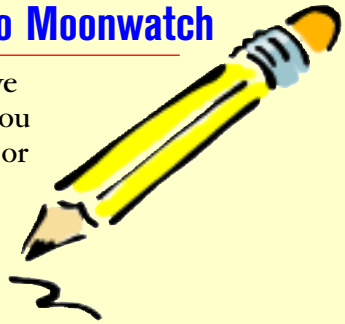
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1	2	3	4
5 sunset: 17:18	6	7	8	9	10	11 6:00 PM Observatory Maintenance (Private)
12 sunset: 17:07	13 7:30 PM Board Meeting (Private)	14	15	16 7:00 PM MDAS Imaging Meeting (Private)	17	18 8:00 PM Society Observing (Private)
19 sunset: 16:56	20	21	22	23	24	25 5:30 PM Public Astronomy: Earth
26 sunset: 16:47	27	28 7:15 PM GenMtg: GREECE aurora sou	29	30	31	

Share your news with other members through the Diablo Moonwatch

We are always looking for new articles, images or photos and content. If you have astronomical perspectives or experiences to share with your fellow members that you would us to consider, please feel free to contact me Jim (jamesnhead@comcast.net) or our newsletter editor Vianney. (veloroute@hotmail.com)

Clear skies!

Jim and Vianney



Board Members & Address

President
Jim Head - planetmatter@gmail.com

Vice President
Mike Harms - cmharms2@gmail.com

Membership Coordinator, Mtg Room
Marni Berendsen - berendsen@aol.com

Meeting Program Chair
Dick Flasck - rflasck@aol.com

Outreach Coordinator, AANC Rep
Jim Head - jamesnhead@comcast.net

Publicity
Manuel Kraemer - mkraemer@pixar.com

Observing Committee Chair, Board Member
Richard Ozer - rozer@pacbell.net

Whats Up Coordinator, Board Member
Kent Richardson - kayarind@sbcglobal.net

Treasurer
Will Roberge - wil@donahue.com

Newsletter Editor; Board Member
Vianney - veloroute@hotmail.com

Webmaster
Jon Steel - jonlee0483@aol.com

Secretary
Moon - Moonglow6@hotmail.com

New Member Steward
Nick Tsakoyias - claytonjandl@aol.com

Mailing address:
MDAS
P.O. Box 4889
Walnut Creek, CA 94596-3754

General Meetings:
Fourth Tuesday every month, except on the third Tuesday in November and December. Refreshments and conversations at 6:45 pm; Meeting begins at 7:15

Where:
Lindsay Wildlife Museum
1931 1st Avenue
Walnut Creek, CA 94597
(925) 935-1978
wildlife-museum.org.

Directions to facility:
From the North: Take 680 South to Treat Blvd. exit. Turn left at light onto North Main St. Turn right on Geary Road. Turn left on Buena Vista. Turn right on First Avenue. The museum is halfway up the block on the left.

From the South: Take 680 North. Take the Treat Blvd./Geary Road exit and turn left over freeway. Go three more lights and turn left on Buena Vista. Turn right on First Avenue. The museum is halfway up the block on the left.

Parking:
The museum is located in a residential area. There are no parking fees nor meters. Please park only in the museum parking lots on the east side of the museum, the Friends Church lot across the street (except Sunday mornings) or on Buena Vista Avenue. Please do not park on First Avenue in front of our neighbors' homes — you will get a parking ticket.